

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-17 (cancelled).

18 (currently amended). A process for the preparation of a two layer metal palladium – or palladium alloy – composite membrane consisting of a porous substrate support and a palladium – or palladium alloy – membrane characterized by comprising the following consecutive steps:

- 1) ~~Rinsing/washing~~ rinsing/washing and drying the porous substrate support,
- 2) ~~Treating~~ treating the porous substrate support with a pore filler in order to decorate the pores of the support and, ~~optionally,~~ the disfigurements of the substrate surface,
- ~~3) optionally, when an excess of pore filler resides on the substrate support surface, cleaning the substrate support in order to remove this excess of surface pore filler,~~
- ~~4) 3)~~ 3) sensitizing and activating with a palladium solution the decorated substrate support,
- ~~5) 4)~~ 4) plating the resulting support with a palladium solution to form the two layer composite membrane,
- ~~6) 5)~~ 5) drying, and

~~7) optionally, 6)~~ subjecting the resulting composite membrane to a post-processing where the pore fillers residing in the pore-channels of the porous substrate are partly removed or reduced in volume through either heating or physical/chemical dissolving.

19 (currently amended). A process according to claim 18 characterized in that in wherein step 2 is performed under vacuum, preferably by immersing the porous substrate in a solution of pore filler in order to ensure that the pores and, optionally, the disfigurements of the substrates are preoccupied with the filler and that there is no palladium ingress into the pores during the consecutive preparation steps.

20 (currently amended). A process according to claim 18 characterized in that wherein in step ~~4~~ 3 the porous substrate support is sensitised in SnCl<sub>2</sub> solution and activated in PdCl<sub>2</sub> solution, respectively.

21 (currently amended). A process according to claim 18 characterized in that wherein in step ~~5~~ 4 the porous substrate is immersed in a an electroless plating solution.

22 (currently amended). A process according to claim 21 wherein the electroless plating solution has the typical composition of [Pd(NH<sub>3</sub>)<sub>2</sub>]Cl<sub>2</sub>, EDTA 2Na, NH<sub>2</sub>-NH<sub>2</sub>-H<sub>2</sub>O, NH<sub>3</sub> H<sub>2</sub>O.

23 (canceled).

24 (currently amended). A process according to claim 23, 18 wherein the composite membrane is dried and then calcined at at least 300°C.

25 (currently amended). A process according to claim 18 characterized in that wherein the pore fillers used have a particle size lower than 0.2 micron, preferably lower than 0.1 micron, ~~more preferably lower than 0.05 micron.~~

26 (currently amended). A process according to claim 18 characterized in that wherein the surface pore fillers are ~~chosen amongst~~ selected from the group consisting of gels, sols, colloids or and precipitates.

27 (currently amended). A process according to claim 26 wherein the pore fillers are ~~chosen amongst~~ selected from the group consisting of Al-sol, Si-sol, Ti-sol, Zr-sol and/or Ce-sol.

28 (currently amended). A process according to claim 26 wherein the pore fillers are ~~chosen amongst~~ selected from the group consisting of hydroxide-colloid, alkali carbonate colloid and/or carbonate colloid.

29 (currently amended). A process according to claim 26 wherein the pore fillers are chosen amongst selected from the group consisting of hydroxide-precipitates, alkali carbonate precipitates and/or carbonate precipitates.

30 (canceled).

31 (currently amended). A composite membrane according to claim 17, or a preparation process as defined above characterized in that according to claim 18 wherein the porous substrate support is selected from one of the following porous materials; the group consisting of porous stainless steel, porous nickel, porous glass or and porous ceramics.

32 (new). Process according to claim 18 comprising, after step 2 and before step 3, the step of cleaning the substrate support in order to remove the excess of surface pore filler when an excess of pore filler resides on the substrate support surface.

33 (new). A process according to claim 18 wherein the heating in step 6 is done by either pyrolysis or calcination.

34 (new). A process according to claim 25 wherein the pore fillers used have a particle size lower than 0.1 micron.

35 (new). A process according to claim 25 wherein the pore fillers used have a particle size lower than 0.05 micron.